

What is claimed is:

1. A card processing system using an IC card capable of exchanging information through an electrical contact with an on-board unit installed in a vehicle using a toll road and a wireless communication with an antenna unit installed at a roadside of the toll road comprising:
 - a first processor configured to execute the process through the wireless communication with the on-board unit by inserting the IC card so as to electrical contact the on-board unit; and
 - a second processor configured to execute the process through the wireless communication with the IC card when an error is generated in the process by the first processor.
2. The card processing system according to claim 1, wherein the first processor and the second processor are executed at an entrance of the toll road, respectively.
3. The card processing system according to claim 1, wherein the first processor and the second processor are executed at an exit of the toll road, respectively.
4. The card processing system according to claim 2 further comprising:
 - comparison/collation means for comparing and collating the on-board unit peculiar information that are stored in the on-board unit and the IC card, respectively when the IC card storing entrance information of the toll road by the second processor is inserted in the on-board unit; and
 - means for storing the entrance information stored in the IC card in the on-board unit when respective if vehicle unit peculiar information are matched by the comparison/collation means.
5. The card system according to claim 2 further comprising:
 - a comparison/collation means for comparing and collating the on-board unit peculiar information and entrance information that should have been stored in the on-board unit and the IC card, respectively when the IC card storing the entrance information obtained by the on-board unit in the entrance processing at the entrance by the first processor is pulled out of the on-board unit and inserted into the on-board unit again; and

means for storing a possibility of illegality in at least either one of the IC card and the on-board unit when at least either one of the on-board unit peculiar information and the entrance information is detected as being mismatch.

6. The card system according to claim 3, wherein the second processor includes judging means for judging the exit process is possible by collating the information obtained from the IC card through the wireless communication with the IC card and the information obtained from the on-board unit before the exit process that is executed by the first processor is abnormally finished, and the exit processor to execute the exit process by determining a vehicle class from the information obtained from the IC card, further comprising: means for storing information of the result of the exit process by the exit processor and the abnormally finished history information in the exit process by the first processor.

7. The card system according to claim 2 further comprising:
notifying means for notifying that the IC card is not inserted in the on-board unit to a user of the IC card when peculiar information of the on-board unit was obtained by the first processor that is executed at the entrance of the toll road but the individual information of the IC card was not obtained;

comparison/collation means for comparing and collating the peculiar information of the on-board unit stored in the on-board unit and the IC card when the IC card is inserted into the on-board unit; and

warning means for warning the possibility of illegality for use of IC cards or on-board units.

8. The card processing system according to claim 3 further comprising:
notifying means for notifying a user of the IC card that the IC card was not inserted in the on-board unit when peculiar information of the on-board unit was obtained by the first processor that is executed at the exit of the toll road but the peculiar information of the IC card couldn't obtained;

comparison/collation means for comparing and collating the peculiar information of the on-board unit stored in the on-board unit and the IC card, respectively when the IC card is inserted into the on-board unit; and

warning means for warning a possibility of illegality for use of IC cards or on-board units when the on-board unit peculiar information are detected as being mismatched as a result of the comparison by the comparison/collation means.

9. The card processing system according to claim 2, wherein the second processor is executed through the wireless communication with the IC card pulled out of the on-board unit and further comprising:

detecting means for detecting that the IC card is inserted into the on-board unit;

means for storing peculiar information of the on-board unit stored in the on-board unit in the IC card and individual card information stored in the IC card in the on-board unit when the detecting means detects that the IC card is inserted in the on-board unit;

comparison/collation means for comparing and collating the peculiar information of the on-board unit stored in the IC card and the peculiar information of the on-board unit stored in the on-board unit when the IC card is inserted in the on-board unit again after the second processor is executed with the IC card pulled out of the on-board unit; and

warning means for warning possibility of illegality when the peculiar information of both the on-board units are detected as being mismatched as a result of the collation by the comparison/collation means.

10. The card processing system according to claim 1 further comprising:

detecting means for detecting a contact defect by the communication through the electrical contact provided in the IC card;

reading means for reading out the information stored in the IC card through an antenna provided in the IC card by the second processor when the contact defect is detected by the detecting means;

means for sending the IC card information read by the reading means to an upper rank host computer for enquiry; and

means for writing the IC card information in a separate new IC card and reissuing this IC card when the match is answered by the upper rank host computer in response to the enquiry made for the IC card.

11. A card processing method using an IC card capable of exchanging information through an electrical contact with an on-board unit installed in a vehicle using

a toll road and through a wireless communication with an antenna unit installed at a roadside of the toll road comprising:

first executing a process through the wireless communication with the on-board unit into which the IC card inserted to electrically contact it; and

second executing a process through the wireless communication with the IC card when an error is generated during the process of the first executing.

12. The card processing method according to claim 11, wherein the first and the second executing are performed at an entrance of the toll road, respectively.

13. The card processing method according to claim 11, wherein the first and the second executing are performed at an exit of the toll road, respectively.

14. The card processing method according to claim 12 further comprising:
comparing and collating peculiar information stored in the on-board unit and the IC card, respectively when the IC card storing entrance information of the toll road is inserted into the on-board unit in the second executing step; and

storing the entrance information stored in the IC card in the on-board unit when the on-board unit peculiar information are matched each other in the comparing and collating step.

15. The card processing method according to claim 12 further comprising:
comparing and collating on-board unit peculiar information and entrance information that should be stored in the on-board unit and the IC card, respectively when the IC card storing the entrance information obtained by the on-board unit in an entrance process of the first executing step performed at the entrance is pulled out of and inserted again into the on-board unit again; and

storing a possibility of illegality in at least one of the IC card and the on-board unit when at least either one of the on-board unit peculiar information and the entrance information is mismatched in the comparing and collating step.

16. The card processing method according to claim 13, wherein the second executing step includes judging whether the exit process can be executable by collating the information obtained from the IC card through the wireless communication with it and the information obtained from the on-board unit before the exit process executed in the first executing step is abnormally finished and the exit processing step to execute the exit process by determining a vehicle class from the information obtained from the IC card

when the exit process is judged executable in the judging step, further comprising:

storing the information of the exit processing result in the exit processing step and the history information of the abnormally finished exit process in the first executing step in the IC card.

17. The card processing method according to claim 12 further comprising:

informing a user of the IC card that the IC card was not inserted into the on-board unit when peculiar information of the on-board unit was obtained but individual information of the IC card could not be obtained in the first executing step performed at the entrance of the toll road;

comparing and collating on-board unit peculiar information stored in the on-board unit and the IC card, respectively when the IC card is inserted into the on-board unit; and

warning a possibility of illegality for use of the IC card or on-board unit when the peculiar information of the on-board units are detected as being mismatched as a result of the collation in the comparing and collating step.

18. The card processing method according to claim 13 further comprising:

informing a user of the IC card that no card is inserted into the on-board unit when peculiar information of the on-board unit was obtained but individual information of the IC card could not be obtained in the first executing step performed at the exit of the toll road;

comparing and collating the on-board unit peculiar information stored in the on-board unit and the IC card, respectively when the IC card is inserted into the on-board unit; and

warning a possibility of illegality of use of the IC card or on-board unit when peculiar information of the on-board units are detected as being mismatched as a result of the collation in the comparing and collating step.

19. The card processing method according to claim 12, wherein the second executing step is performed through the wireless communication with the IC card pulled out of the on-board unit, further comprising:

detecting that the IC card is inserted into the on-board unit;

storing on-board unit peculiar information stored in the on-board unit in the IC card and storing individual card information stored in the IC card in the on-board unit;

comparing and collating the on-board unit peculiar information stored in the IC card with the on-board unit peculiar information stored in the on-board unit when the IC card pulled out of the on-board unit is inserted into the on-board unit again after the second executing step is performed with the IC card;

warning a possibility of illegality when the peculiar information of the on-board units are detected as being mismatched as a result of the collation in the comparing and collating step.

20. The card processing method according to claim 11 further comprising:

detecting a defective contact through the communication with the electric contact provided in the IC card;

reading out information stored in the IC card through an antenna provided in the IC card according to the second executing step when the defect of the contact is detected by the detecting step;

requesting an enquiry by sending the IC card information read in the reading step to an upper rank host computer; and

writing the IC card information in a separate new IC card and reissuing this IC card when the match is answered by the upper rank host computer in response to the enquiry made for the IC card in the requesting step.